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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/709,563
Filing Date: May 13, 2004
Appellant(s): GIBBS ET AL.

Marc F. Malooley
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 8/6/07 appealing from the Office action mailed 3/9/07.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

3,719,536	RHEINGOLD ET AL.	3-1973
4,020,762	PETERSON	5-1977
5,596,912	LAURENCE ET AL.	1-1997
4,944,986	ZUEL	7-1990
3,656,951	ANDERSON ET AL.	4-1972
6,988,342	LUETGERT ET AL.	1-2006
2004/0071936	MARTELLI	4-2004

Kohler, Michael; "Etching in Microsystem Technology", pp.13-17 and 116-117., Wiley-VCH, 1999.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim 1-6 are rejected under 35 U.S.C. 103(a) as obvious over U.S. Patent Application Publication 2004/0071936 to Martelli, in view of the Publication "Etching in Microsystem Technology" to Köhler and U.S. patent 4,944,986 to Zuel.

Regarding Claim 1, Martelli teaches a method for producing a mold tool to achieve a reduced gloss (matte) appearance on a surface of a polymeric component (Paragraphs 3-15) produced with the tool, the method comprising: masking a portion of a surface of the tool with a plurality of characters arranged in a character pattern, and applying an etching material to the tool surface, (See Paragraphs 25-33) thereby removing material from an unmasked portion of the tool surface and leaving the masked portion raised above the unmasked portion and forming a tool surface pattern generally matching the character pattern, the tool surface pattern including a plurality of raised portions (lands), the tool surface pattern thereby providing a reduced gloss (matte) appearance on a corresponding surface of a polymeric component produced with the tool. Note that *caustic* is interpreted any substance that is capable of destroying or eating away by chemical action.

Martelli suggests using etching such as chemical etching to form the depressions and lands. (Paragraphs 26-29) However, Martelli does not expressly recite the steps of masking the surface. However, masking is a conventional step of preparing a surface for selective chemical etching to form a patterned material layer as recited in Martelli. For example, Köhler teaches that the step of masking is conventional in chemical etching processes to provide etching in a desired pattern. Figures 2-2 and 2-3 of Köhler clearly illustrate the conventional steps including: masking a portion of a surface of the tool with a plurality of characters arranged in a character pattern, and applying an etching material to the tool surface, thereby removing material from an unmasked portion of the tool surface and leaving the masked portion raised above the unmasked portion and forming a pattern generally matching the character pattern, the surface pattern including a plurality of raised portions as broadly recited in Claim 1. Further, the photoresist/masking step is conventional in the art as admitted by applicant. (See Paragraph 17 of Specification)

Further regarding Claim 1 and Claims 3-5, Martelli teaches the depth of depressions is 0.1-100 μm (Paragraph 29) and may have varying density with a ratio of depressions to lands "preferably from about 50 to 80 percent". Martelli further teaches that the width of the depressions that define raised portions (lands) may vary as needed in order to form the desired aesthetic appearance such as diffused light effect (Paragraphs 8, 9, 26 and 31), but does not expressly provide that the maximum width of the raised portions is less than 350μm or 225-275μm, average spacing less than 450μm, or density greater than 6000 raised portions per square inch. However, it is notoriously old and well known in the science of scattering light (diffusion) that the width and density of depressions and raised portions may vary within the recited micron range, in order to produce a diffusion of light effect on a surface, such as gloss reduction as recited in Martelli. For example, Zuel teaches that for forming a light diffusion effect on a surface, raised portions may have a maximum width of 10-120μm, a spacing of 100-2000μm, and teaches a density of 25-500 raised portions per square millimeter. Note that as one of ordinary skill in the art would readily appreciate, the raised portions of a mold correspond to the depressed portions of a molded surface and would thus be in a range of 100-2000μm. Similarly, the depressed portions or "average spacing" of a mold correspond to the raised portions of a molded surface and would thus be in a range of 10-120μm.

Thus, in view of Martelli, which teaches the depth of depressions is 0.1-100 μm and a ratio of depressions to lands from about 50 to 80 percent and that the width of the depressions that define raised portions may vary as needed in order to form the desired aesthetic appearance such as diffused light effect appearance, (Paragraphs 8, 9, 26 and 31) and Zuel which teaches the well-known feature size range for such diffused light effect appearance, it would have been obvious to one of ordinary skill in the art at the time of invention to provide maximum width of the raised portions is less than 350μm or 225-275μm, average spacing less than 450μm, or density greater than 6000 raised portions per square inch, in order to provide gloss reduction to the molded product having varying aesthetic appearance.

Regarding Claim 2, Martelli teaches a feature height of about 0.1-100 microns. (Paragraph 29)

Regarding Claim 5, the term cylindrical is broadly defined by applicant to include non-circular, oval and polygonal shapes (*See Specification, Paragraph 26*) and so does not define over the shapes of

Martelli. Note that Claim 5 recites merely a "maximum width" and thus broadly reads on any width less than 275 microns as well as within the recited range

Regarding Claim 6, Martelli teaches providing the tool surface with another pattern different from the tool surface pattern, thereby providing a corresponding aesthetic pattern to a corresponding surface of a polymeric component produced with the tool. Note that the "another pattern" reads broadly on the pattern formed in the mold to define the object itself, the additional patterning formed by the additional blasting step (Paragraph 32), the added colorant (Paragraph 12), or the different regions with varied lands and depressions (Paragraph 31)

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication 2004/0071936 to Martelli, in view of "Etching in Microsystem Technology" to Köhler and U.S. patent 4,944,986 to Zuel and in further view of U.S. Patent 6,988,342 to Luetgert et al.

Regarding Claim 6, as applied above, Martelli teaches an additional pattern that is formed in the mold to define the object itself, the additional patterning formed by the additional blasting step (Paragraph 32), the added colorant (Paragraph 12), or the varied pattern of lands and depressions (Paragraph 31) However, Luetgert et al. further teaches that it is old to align and join different patterns together as required to cover the surface to be etched. (Col. 7, Lines 51-56) Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to provide the tool surface with another pattern different from the tool surface pattern, in order to provide a continuous pattern on the surface of the tool, as this step is entirely conventional in the printing art.

Regarding Claim 7, Martelli does not expressly teach the details of the masking, however the recited steps are entirely conventional in the pattern forming art. For example Luetgert et al. teach at least partially filling portions of an exposed plate with a spreadable material (wax), applying transfer paper to the metallic plate, transferring the wax from the paper to a mold tool surface and etching the mold tool surface. (Col. 7, Lines 44-51) It would have been obvious to one of ordinary skill in the art at the time of invention to use conventional patterning methods for pattern transfer.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication 2004/0071936 to Martelli, in view of "Etching in Microsystem Technology" to Köhler, U.S. patent 4,944,986 to Zuel and U.S. Patent 6,988,342 to Luetgert et al. and in further view of U.S. Patent 3,656,951 to Anderson et al.

Regarding Claim 8, Martelli does not expressly teach the etch rate of 25 microns per three minutes, however, the etch rate is simply an inherent result of the selected etchant, metal and process conditions such as concentration and temperature. It would have been obvious to one skilled in the art at the time of invention to select from known metals and caustics to achieve a suitable etch rate for the selected metal.

Moreover the formation of lithographic masters from zinc using $FeCl_3$ solutions is old in the lithography art and would inherently provide the etch rate using suitable process conditions to form suitably shaped depressions. For example, U.S. Patent 3,656,951 to Anderson et al. teach using ferric chloride as an etchant for zinc printing plates. (Col. 4, Lines 56-60)

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication 2004/0071936 to Martelli, in view of "Etching in Microsystem Technology" to Köhler, U.S. patent 4,944,986 to Zuel and U.S. Patent 6,988,342 to Luetgert et al. and in further view of U.S. Patent 4,020,762 to Peterson.

Regarding Claim 9, Martelli teaches laser etching for forming cavities in the metal mold, (Paragraph 27), but Martelli in view of Luetgert do not expressly teach laser etching may be used to form the cavities in a master printing plate. However, Peterson teaches that it is old in the art of forming patterns in a metal printing plate to use laser etching. It would have been obvious to one of ordinary skill in the art a the time of invention to use laser etching in order to provide high resolution printing plates in the conventional manner.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication 2004/0071936 to Martelli in view of "Etching in Microsystem Technology" to Köhler, U.S. patent 4,944,986 to Zuel and U.S. Patent 6,988,342 to Luetgert et al. and in further view of U.S. Patent 3,719,5356 to Rheingold et al.

Regarding Claim 10, Martelli teach an average feature depth of 0.1 to 100 microns, however Martelli in view of Luetgert do not expressly teach depth of the pattern formed in the printing plate. However, Rheingold et al. teach that it is old in the art of etching with a resist to use a thickness of approximately 0.002 in (50 microns) and generally to use a thickness less than 0.005 in (127 microns) since no particular advantage in using additional thickness. (Col. 12, Lines 30-40) It would have been obvious to one of ordinary skill in the art a the time of invention to use a depth of approximately 37 microns as claimed, in order to provide suitable protection thickness for the printed resist without wasting material.

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication 2004/0071936 to Martelli in view of "Etching in Microsystem Technology" to Köhler, U.S. patent 4,944,986 to Zuel and in view of U.S. Patent 5,596,912 to Laurence et al.

Regarding Claims 11 and 12, Martelli teach performing a conventional abrasive blasting process after the etching process. (Paragraph 32) Martelli does not teach the steps of blasting with multiple steps using a smaller abrasive size. However, the steps of abrasive blasting using a smaller mesh size is conventional in the art of abrasive blasting. For example, Laurence et al. teaches that using progressively smaller abrasive bead sized results in favorable appearance properties. (See Columns 1-4) It would have been obvious to one of ordinary skill in the art at the time of invention to use abrasive blasting in multiple steps using smaller size abrasives in order to provide the desired surface finish.

Regarding the particular abrasive sizes claimed, selection from the commercially available abrasives would have been obvious to one skilled in the art as a matter of producing a surface having the desired texture and gloss characteristics.

(10) Response to Argument

Applicant has argued that Zuel is not properly combinable with Martelli since the treatments of Zuel are applied directly to a surface whereas the treatments of Martelli are to a mold surface.

However, the rejection does not rely on combining the treatments of Zuel with those of Martelli. Zuel is only cited to teach that the width dimension for a frosted or etched glass appearance is well known to be in the micron range. Martelli teaches all of the treatment steps, even including teaching that the width of depressions that define lands may vary as needed to achieve any aesthetic appearance. (See Paragraph 31 of Martelli) It is clear from Martelli alone that the width of depressions and lands must necessarily vary within approximately a micron range in order to form a grid of depressions and lands having the depth in the recited micron range, and ratio of depressions to lands as suggested in (Paragraph 29) of Martelli, while providing a varied aesthetic appearance as suggested in (Paragraph 31) of Martelli. However, Zuel is simply further cited as an example showing the size range and spacing of depressions and lands providing the aesthetic appearance such as frosted or etched glass is well known to vary in the micron range recited by applicant.

Applicant has argued that there is no reason to combine the references because the discussion of the "islands" in Zuel speaks to exactly the opposite feature that will be present in a finished part produced by the method recited in claim 1, and the method discussed in Martelli.

The argument is not persuasive since, as discussed above, the treatment techniques are not combined in the rejection. One of ordinary skill in the art would readily appreciate that the raised portions of a mold correspond to the depressed portions of a molded surface and that the depressed portions or "average spacing" of a mold correspond to the raised portions of a molded surface. (See Paragraph 29 of Martelli) The since the size of the features of a mold (Martelli) to make a desired product surface is directly relevant to the size of the features of a desired product surface (Zuel) even if those features are "opposite" negative images as argued by applicant.

Applicant has argued that Luetgert et al. does not describe the use of two different patterns as specifically recited in claim 6 of the present application. Rather, Luetgert et al. discusses the use of multiple pattern transfers, presumably having the same pattern, and that is why it is important to "align and join" them together so that there is no obvious line of demarcation between different pattern transfers. There is nothing to indicate that two separate patterns are being used as specifically recited in claim 6 of the present application.

The argument is not persuasive because Luetgert teaches the recited limitations as broadly recited in Claim 6, by applicant. It is noted that Claim 1 recites only "*another pattern different from the tool surface pattern*". However, even if the claims recited patterns having a different shape, for example, it is noted that Luetgert et al. teaches different shape patterns to form tonal portions. Further, Claim 6 is also rejected over Martelli, in view of Köhler and Zuel without Luetgert et al.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

R. Culbert

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